

Climate, Snowpack, and Applied Hydrology Assessment

1. Summary of current activities

- Construction of a historical hydrologic data set that describes the range of climate and hydrologic variations in our study area.

SNOTELL, snowcourse, daily rainfall, and streamflow measurements.

- Completion of climate simulations of the 20th Century.

NCAR CCM3 runs from 1903-1994, 10 member re-enactments.

- Assess the prospect of downscaling to river-basin scale.

Implement a downscaling dynamical model, with application to the Interior West.

- Develop hydrologic streamflow models for river basins of the interior West.

Work in collaboration with the USGS to apply an existing streamflow models to select river basins of the Colorado.

- Develop an inventory of existing climate products and forecasts that can serve the needs of various users.

A web-based approach is being used to collect, in one location, the existing suite of climate products, both operational and experimental.

2. *Proposed new activities*

- Define the climate history of the Upper Colorado River Basin.

Provide the historical benchmark for climate and hydrologic variability in the Interior West.

- Develop an optimal suite of climate services and products.

Develop an "enabling infrastructure" by which users can access and interact with NOAA's current and emerging suite of climate products. A prototype Web-based enabling tool can be viewed at

<http://www.cdc.noaa.gov/~cas/Howe/>

- Accelerate the time for operationalizing new climate products.

The Climate Diagnostics Center has a strong track record in testing and developing new climate products. Through their close partnership with NOAA's National Centers for Environmental Predictions, the time to implementing such new climate products, ones that address specific user needs, can be greatly shortened.

- Implement and evaluate short-term hydrologic forecasts for the Upper Colorado River Basin.

Couple atmospheric models, and their prediction of rainfall and temperatures, with streamflow models adapted to the terrain of the Interior West.

- Assess the skill and value of prediction products on one 1-2 week time scales.

Determine the skill of operational 2-week forecasts of rainfall and temperature. Assess the utility of such forecasts (e.g. for reservoir and streamflow management), and seek to add value to existing suites of operational forecasts products, or develop new products where needed.

- Assess the skill and value of prediction products on interannual time scales.

Determine the scientific capacity to predict precipitation, snow pack, and other relevant climate variables at long lead time. Determine the effect of El Niño/Southern Oscillation on the region's year-to-year climate variations, and particularly its interaction with the complicated terrain of the Interior West.

- Interpreting climate trends and decadal variations, and implications for climate change in the 21st century.

Document the decadal variations of climate in the region over centuries, including the occurrences of severe drought and wet periods. Assess the origin of such variations, and implications for climate change in the Interior West during the 21st Century.

